

Appendix F

Biological Opinion Spill And Court Ordered Spill

BIOLOGICAL OPINION SPILL and COURT ORDERED SUMMER SPILL.

Introduction:

Each year, the US Army Corps of Engineers tracks the amount of water spilled over the spill gates of a project for juvenile fish passages, which is referred to as Biological Opinion spill, or BiOp spill for short. BiOp spill does not include involuntary spill that occurs for flood control or spill because of physical problems with the hydropower system. It also does not include other “miscellaneous” passage of water through a project such as through fish ladders, sluiceways, lockage, etc. This appendix provides an overview of how the BiOp spill amounts were calculated, tables of the BiOp spill amounts for COE projects on the Lower Columbia and Snake rivers and graphs of the data.

Overview of Spill calculations

The calculations of BiOp spill for juvenile fish passages are based on methods that have been used over the past several years to monitor how well the projects and BPA are implementing juvenile fish spill based on the instructions given to the projects and BPA by the Corps via teletypes. Excel spreadsheets have been developed that display the actual project spill and calculate the spill specified for juvenile fish passage (BiOp spill). Both of these values are displayed on a graph so that with a quick glance BiOp spill operations can be monitored.

The mathematical functions developed to calculate BiOp spill take into consideration the BiOp spill requirements, the 120/115% gas cap in effect, the minimum generation requirements, any major tests that are going on during the spill season, and in some cases the 1% efficiency unit operating requirements. Each project has its own function. The Corps can make these functions available for review. Each year several of the functions are modified to take in to consideration any changes in effect for the current year. These changes are usually due to research ongoing at the project (Like the RSW test at Lower Granite). Sometimes changes are needed due to changing instructions to the project. For example in 2001 there was a minimum spill level of 15 kcfs set at The Dalles. With respect to short tests at projects, like a three-day spill test or other short-term regulation changes, these functions are not always adjusted.

One item to consider when seeing if the projects and BPA are complying with their instructions is to review how the projects operate the spill gates. The spill gates are opened a number of stops. These stops are a set distance. For example, a stop may be 1 foot. The project can open the gate 1 stop (1 foot) or 2 stops (2 feet) but not 1.5 stops. This means that the project can spill certain amounts; let's say for example 98 kcfs or 102 kcfs (each additional stop open increases spill 4 kcfs) but not 100 kcfs. So if the spill cap at the project were 100 kcfs the project would spill 98 kcfs not 102 kcfs, which would be over the spill cap. See the spill patterns in the Fish Passage Plan for examples of this. See notes below for changes in this at TDA and JDA.

Note: Starting this year, the day and night spill times were adjusted to reflect Table Bon-6 in the FPP.

Project specific information

In paragraphs below, spill refers to spill for juvenile fish passage. It is important to note that for all projects, spill was never voluntarily to exceed the 120% TDG cap.

Bonneville:

In August 2004, it was determined that the spill levels reported were incorrect. In the winter of 2004/2005, the spillgates were calibrated and new spill flow computations were developed. The methodology for the changes to the computations were reported in the report “Bonneville Spill Patterns 2002-2004 and in the future” by Laurie Ebner dated February 17, 2005. The new computations were used in 2005. Although the requested level of spill was the same as last year, this year the volume of spill was greater than last year.

Spill started April 15 at 1800 hours a spill of 50 kcfs 24 hours a day and the second powerhouse corner collect was opened on April 15 beginning at 1500 hours. Spill was at this level to protect chum redds from dissolved gasses. On April 19 at 2030 hours, the spill level was raised to 75 kcfs (adult fallback limit) during the daytime and spill to the 120 gas cap level at nighttime. If a minimum daytime generation flow of 50 kcfs was not met than the daytime spill could be reduced to a minimum of 50 kcfs. Spill ended September 1 at 0001 hours and the second powerhouse corner collector was closed at August 31 at 0915 hours. The BiOp spill amounts for Bonneville are shown on Figure F-1 and listed on Table F-1.

The Dalles

Spill started April 11 at 0830 hours. The spill was 40% of the project outflow 24 hours a day. But because of the poor condition of spillgates 3 through 6 cables, these gates were opened to set openings and gates 1 and 2 were adjusted to make up the difference for the 40% spill level. The set gate openings were 6 ft lengths between on April 11 and May 2 at 1000 hours, 8ft between May 2 at 1000 hours and August 8 at 0830 hours, and 6 ft between August 8 at 0830 hours and September 1 at 0200 hours. Spillgates 1 and 2 opening could not be opened larger than 8 ft between May 25 at 1500 hours and June 22 at 1600 hours. Spill was shut off for a short period of time on June 21 in order to do a spillway inspection. Spill ended September 1 at 0200 hours. The BiOp spill amounts for The Dalles are shown on Figure F-2 and listed on Table F-2.

John Day

Spill started April 10 at 1800 hours. The spill level was 60% of the project outflow at night. Night time hours were between 1800 hours and 0600 hours from April 10 to May 14 and between 1900 and 0600 from May 15 to June 20. Because The Dalles Dam was not able to meet the corps’ commitment of spilling 40% of the river flow as stated in its Updated Proposed Action (UPA), John Day spill was adjusted to meet the biological performance expected in the UPA. From May 20 at 1200 hours to May 30 at 1800 hours,

spill was increase by spilling 40% of its spillway volume during the daytime. On July 21 the spill amount was changed to 30% 24 hours a day. Spill ended August 31 at midnight. The BiOp spill amounts for John Day are shown on Figure F-3 and listed on Table F-3.

McNary

Spill started April 10 at 1800 hours, spilling to the 120% gas cap at night. The spill level could be reduced if necessary for safe fish barge operation. There were numerous changes in the spill pattern because of passage studies. The first study using randomly chosen two day blocks was from April 23 to June 5 testing a 24 hour spill operation (spilling 85 kcfs) against a 12 hour spill operation (spilling to the 120% gas cap). The second study from June 22 at 2000 hours to June 30 at 0600 hours was documenting passage time of a spill operation that spill at minimum of 20 kcfs 24 hours a day.

Court ordered summer spill started July 1 at 0001 hours and continued until September 1 at 0001 hours. The project was to provide 50 kcfs flow through the powerhouse and spill to the 120% gas cap before generating more. The BiOp spill amounts for McNary are shown on Figure F-4 and listed on Table F-4.

Ice Harbor

There were two fish test at Ice Harbor during the 2005 spill season: a balloon tag test and a RSW spill test. Daily testing using balloon tags occurred from April 4 to April 17 between 0700 hours and 1800 hours by spilling 18 kcfs. During this testing, spill for juvenile fish passage started on April 7 at 1800 hours. The spill operation was spilling up to the 120% gas cap at night and spilling 45 kcfs during the day when not balloon tag testing. Spill was stopped on April 11 for installation of Hydro-acoustic equipment between 0900 hours and 1800 hours, partially closed on April 20 between 0800 and 1700 for RSW testing equipment removal, and partial closed on April 23 and April 24 for hydro-acoustic equipment installation.

RSW testing started March 31 at 1430 hours for a few hours. Starting April 22 at 0600 hours and continuing until July 21 at 0600 hours, a test using randomly chosen 2 day blocks was conducted between a RSW spill operation that spilled about 30% of total river flow and a spill operation that spilled up to the 120% gas caps 24 hours a day.

Court ordered spill begin June 20 at 0001 hours. A study from June 20 at 0001 hours to July 22 at 0600 hours was conducted comparing a spill operation that provided only enough flow to generating one turbine at low end of 1% peak efficiency table and spilled the rest up to the 120 gas cap before generation more and a spill operation that spilled 24 hours a day about 30% of total river using the RSW. From July 22 at 0600 hours until Sept 1 at 0001 hours a spill operation was conducted that provide only enough flow to generate at low end of 1% table from one turbine while spilling up to the 120% gas cap before generating more. The BiOp spill amounts for Ice Harbor are shown on Figure F-5 and listed on Table F-5.

Lower Monumental

There were two fish test at Lower Monumental during the 2005 spill season: a survival test and a balloon tag test. The spill survival test occurred from May 3 to May 27 spilling about 18 kcfs between 1000 hours and 1500 hours. The involuntary spill that occurred during this time period was spilled during the hours that were outside of the test period. A spill operation was conducted provide spill when large numbers of fish were passing the project. The spill operation occurred from May 9 at 14 to May 13 at 1500, spilling during non-testing hours about 19 kcfs.

A balloon tag study occurred from May 29 to June 6 between 0800 hours and 1800 hours spilling about 18.2 kcfs.

Court ordered spill occurred beginning June 20 at 0001 hours to September 1 at 0001 hours. The spill operation was to provide only enough flow from one turbine to generate at the low end of the peak efficiency table and then spilling to the gas cap before generating more. The BiOp spill amounts for Lower Monumental are shown on Figure F-6 and listed on Table F-6.

Little Goose:

Court ordered spill occurred beginning June 20 at 0001hours to September 1 at 0001 hours. The spill operation was to provide only enough flow to generate from one turbine at the low end of the peak efficiency table and then spilling to the gas cap before generating more. This initial spill operation was followed until the numbers of adult fish migrating pass Little Goose dropped significantly. On June 24th, the spill operations at Little Goose were changed to spill up to the gas cap with station service but if river flow were greater than 43.4kcfs, a second generator could be used. This was an attempt to decrease adult passage delay by increasing flow from the powerhouse. This spill change did not produce the desired effects. Therefore, on June 28th the spill operations was modified again to spill 50% of the total river flow from 500 to 2100 hrs and from 2100 to 500 hrs, spill up to the gas cap with 11.5 kcfs station service before generating more. This changed did not produce the desired effects either. So on June 30 the spill operation was modified again to spill 30% of total river flow from 1200 hours to 2000 hours and from 2000 to 400 hrs spill up to the gas cap with 11.5 kcfs station service before generating more. This operation increased the number of adult fish passing Little Goose dam significantly so this spill operation remain in effect the rest of spill season, except for some minor changes like the hours when the spill regimes changed. The BiOp spill amounts for Little Goose are shown on Figure F-7 and listed on Table F-7.

Lower Granite:

A RSW test of two day randomized blocks was conducted from June 20 0001 and July 22 0600 hours with the first condition as the RSW spilling to 18.6 kcfs and the second

condition as a spill operation that provided enough flow to generate from only one turbine at the low end of the peak efficiency table and then spilling to the gas cap before generating more.

On April 28 a teletype was sent out to spill using the RSW when large numbers of juveniles were present. Spill for the large number occurred on April 30 between 0400 hours and 1005 hours, May 2 from 0630 hours and 1455 hours, May 7 from 1405 hours to 2111 hours, May 9 0905 hours to 2255 hours, May 13, and May 16.

Court ordered spill occurred beginning 0001 June 20 to September 1 at 0001. The spill operation was to provide only enough flow from one turbine to generate at the low end of the peak efficiency table and then spilling to the gas cap before generating more. Since there was a RSW test occurring during some of this period, operations were modified to accommodate the test. The BiOp spill amounts for Lower Granite are shown on Figure F-8 and listed on Table F-8.

FIGURE F-1
BiOp Spill at Bonneville

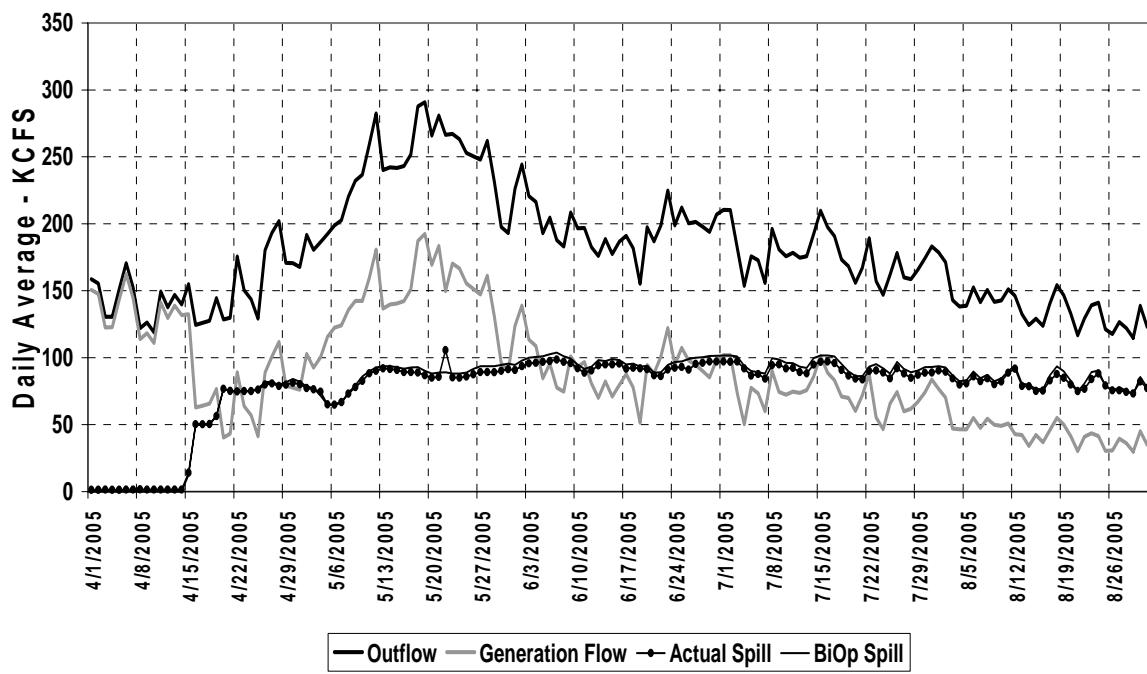


FIGURE F-2
BiOp Spill at The Dalles

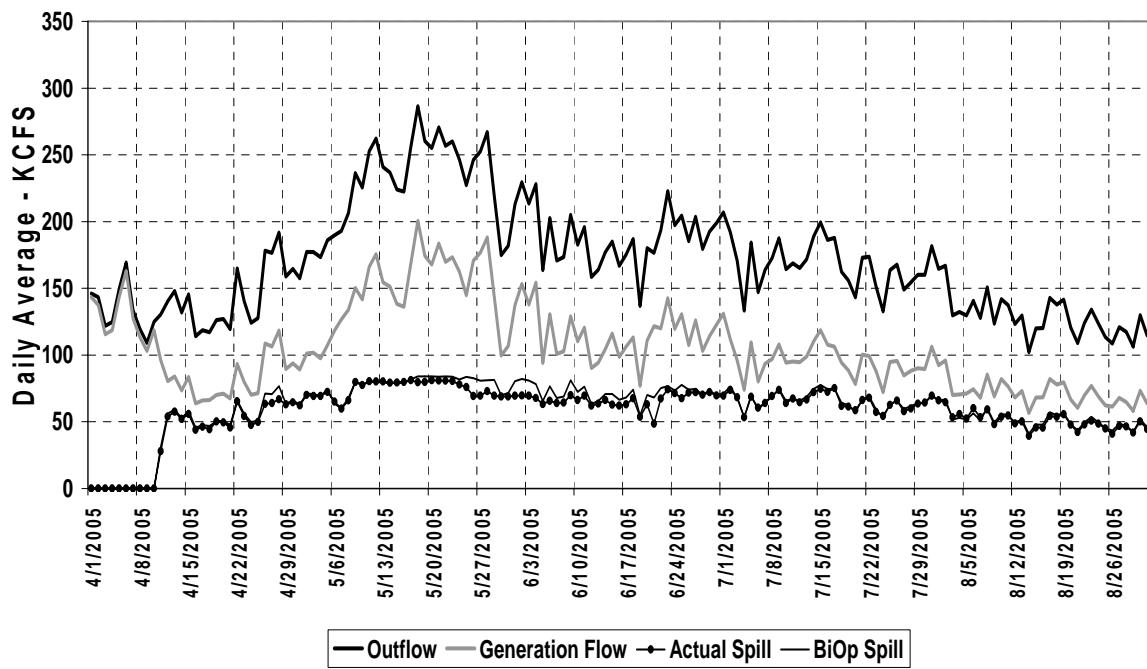


FIGURE F-3
BiOp Spill at John Day

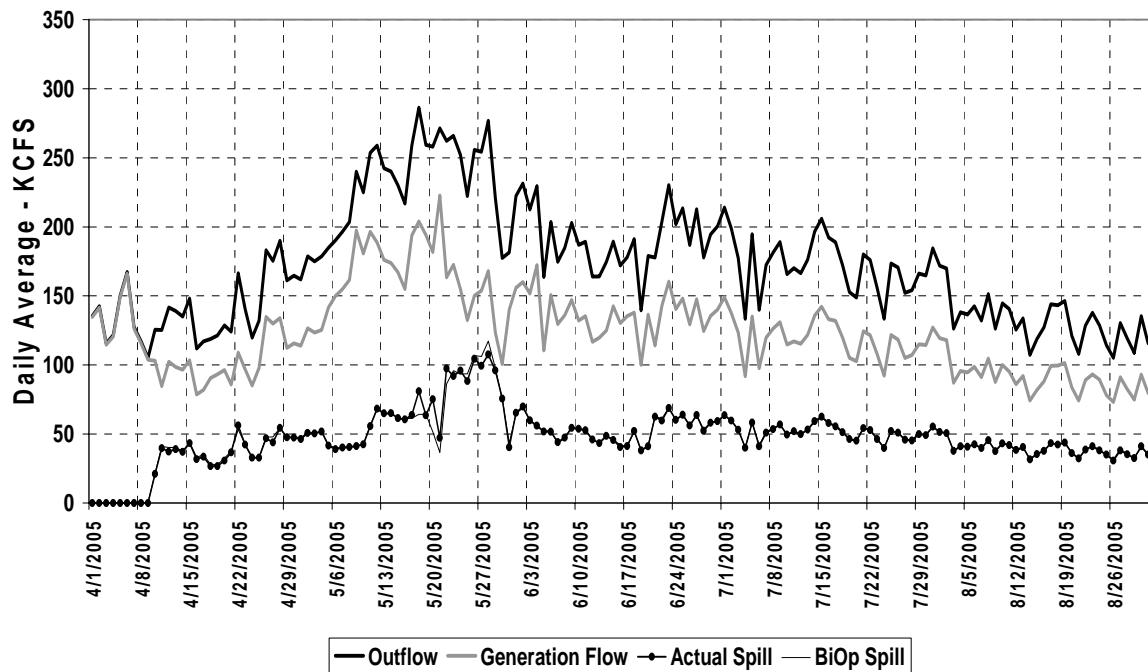


FIGURE F-4
BiOp Spill at McNary

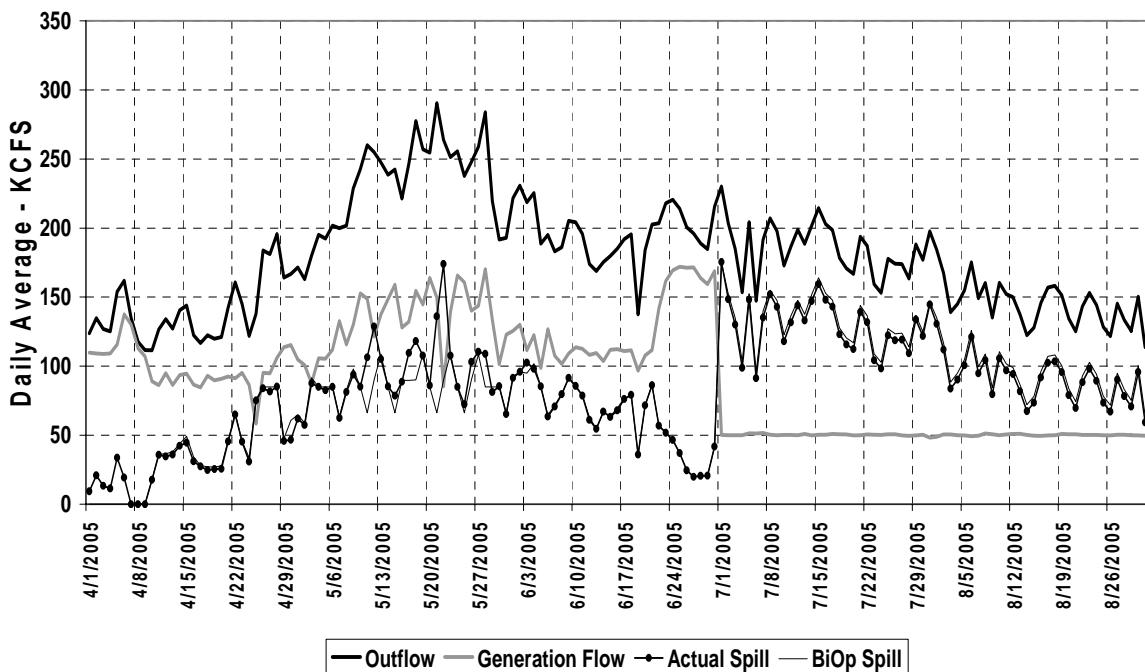


FIGURE F-5
BiOp Spill at Ice Harbor

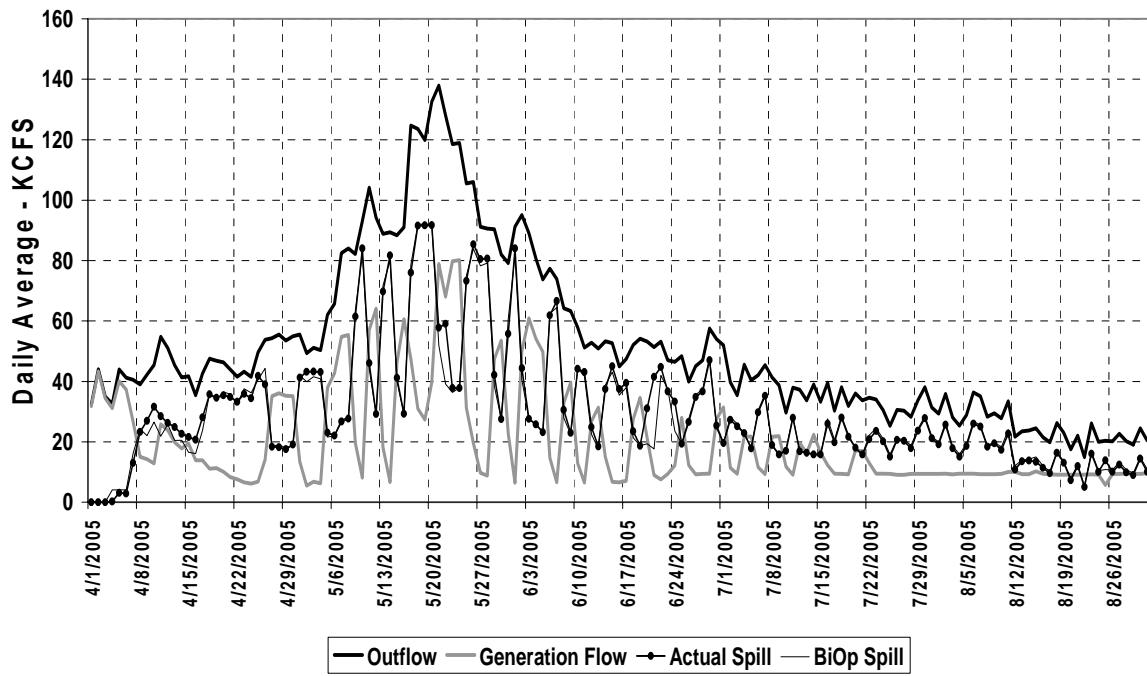


FIGURE F-6
BiOp Spill at Lower Monumental

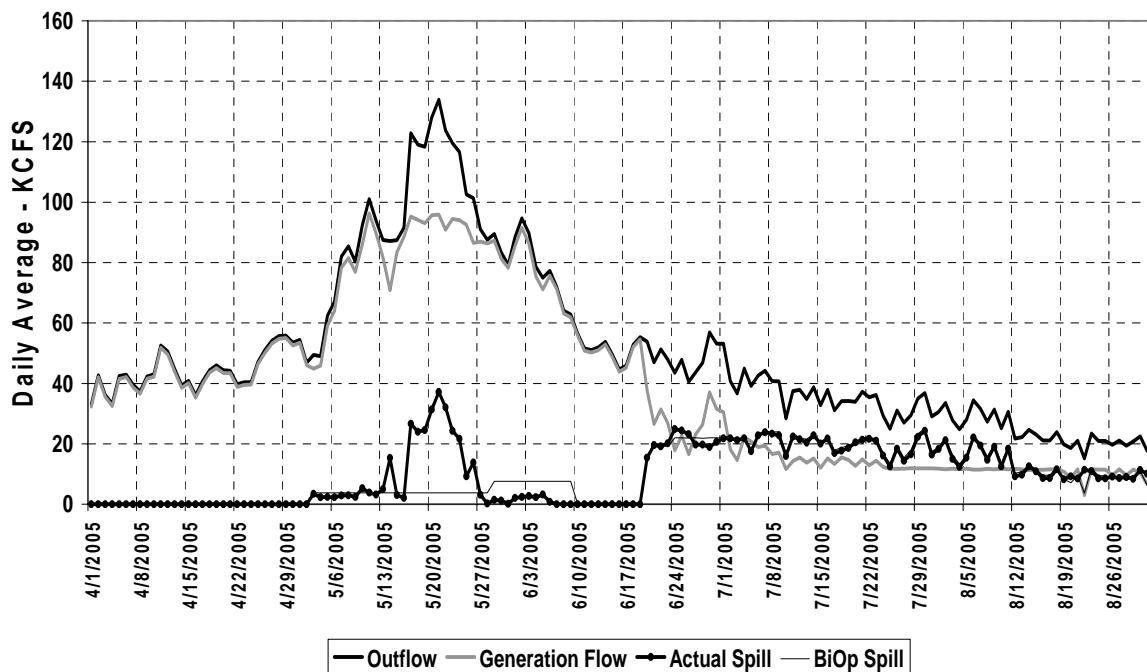


FIGURE F-7
BiOp Spill at Little Goose

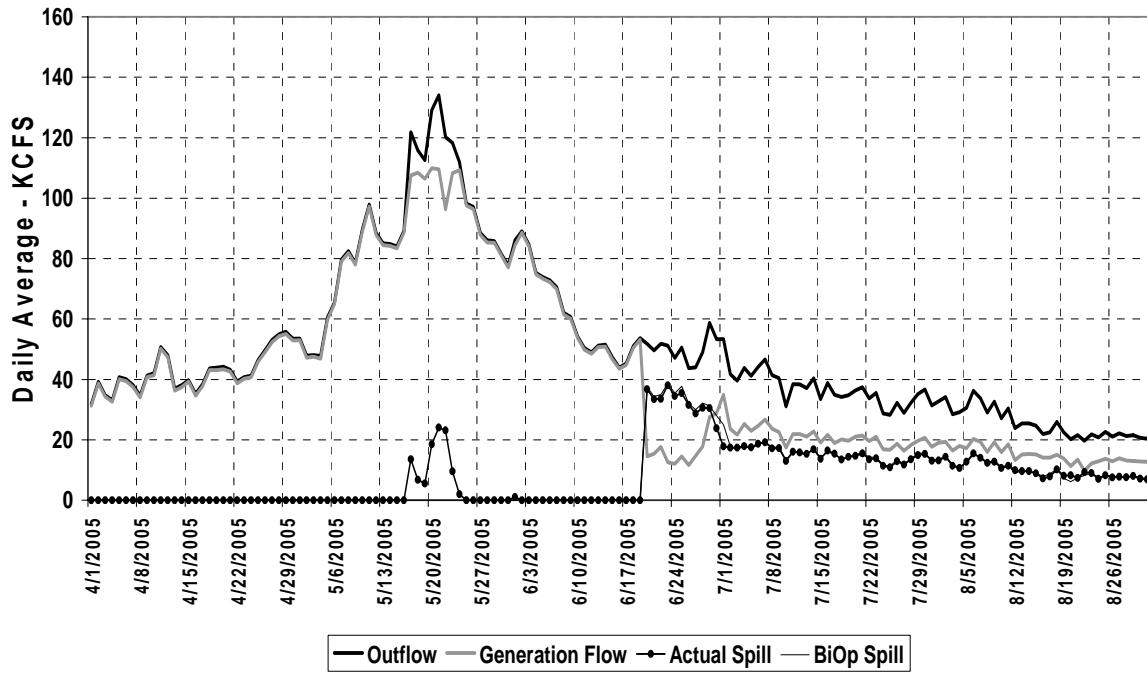


FIGURE F-8
BiOp Spill at Lower Granite

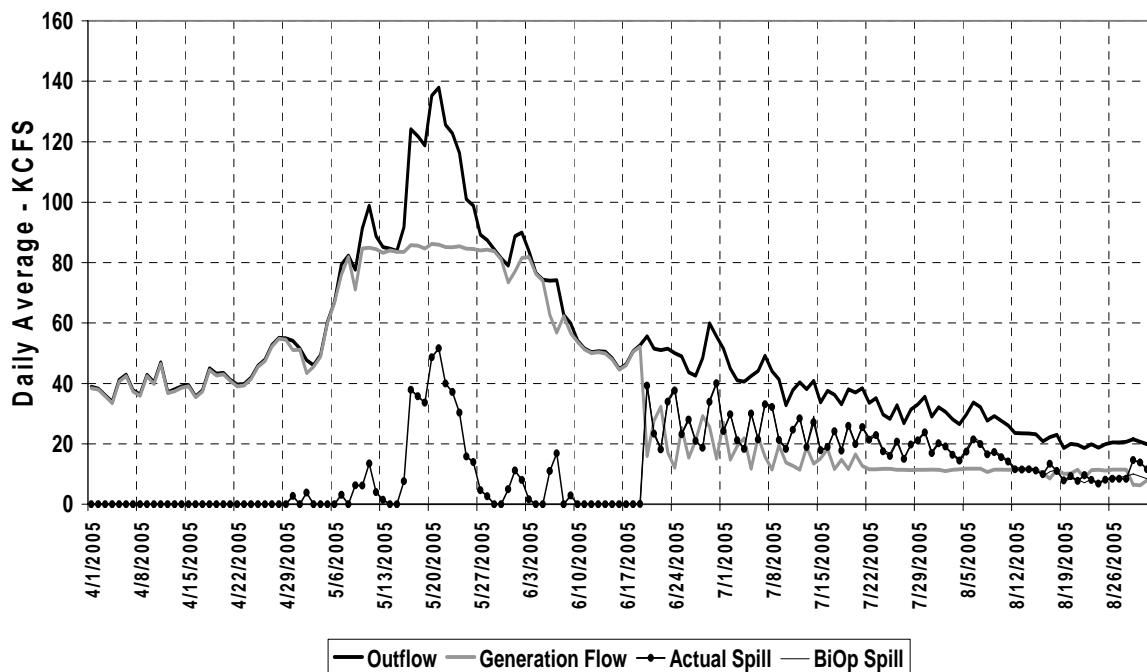


TABLE F-1

BiOp Spill at Bonneville

Date	Outflow	Generation Flow	Actual Spill	BiOp Spill	Date	Outflow	Generation Flow	Actual Spill	BiOp Spill	Date	Outflow	Generation Flow	Actual Spill	BiOp Spill
04/01/2005	158.60	150.72	1.38	0.00	05/22/2005	266.41	149.59	105.60	89.17	07/12/2005	174.59	73.76	89.32	93.29
04/02/2005	155.35	147.57	1.31	0.00	05/23/2005	267.18	170.45	85.22	88.13	07/13/2005	175.74	75.84	88.40	92.37
04/03/2005	130.57	122.57	1.52	0.00	05/24/2005	263.22	166.57	85.17	88.13	07/14/2005	192.46	86.16	94.78	99.86
04/04/2005	130.69	122.83	1.39	0.00	05/25/2005	252.90	155.64	85.87	88.96	07/15/2005	209.82	101.40	96.93	101.67
04/05/2005	150.95	143.20	1.38	0.00	05/26/2005	250.49	151.43	87.61	91.67	07/16/2005	197.43	88.78	97.13	101.65
04/06/2005	170.61	162.52	1.60	0.00	05/27/2005	247.99	147.25	89.25	93.75	07/17/2005	190.82	83.28	96.03	100.97
04/07/2005	152.60	144.58	1.53	0.00	05/28/2005	262.05	161.25	89.31	93.75	07/18/2005	173.36	71.03	90.85	95.49
04/08/2005	122.07	113.92	1.64	0.00	05/29/2005	231.43	130.78	89.15	93.75	07/19/2005	168.28	70.15	86.64	89.94
04/09/2005	126.29	118.26	1.55	0.00	05/30/2005	197.60	95.76	90.35	94.58	07/20/2005	156.03	60.20	84.34	86.34
04/10/2005	119.00	110.93	1.54	0.00	05/31/2005	193.03	90.13	91.39	95.63	07/21/2005	167.22	71.90	83.80	86.32
04/11/2005	149.56	141.29	1.55	0.00	06/01/2005	226.15	123.83	90.83	94.58	07/22/2005	189.28	87.82	89.98	93.33
04/12/2005	137.63	129.60	1.50	0.00	06/02/2005	244.28	138.93	93.78	97.92	07/23/2005	157.33	55.40	90.44	95.30
04/13/2005	146.94	138.92	1.55	0.00	06/03/2005	220.66	113.42	95.75	100.00	07/24/2005	146.92	46.57	88.84	92.10
04/14/2005	139.84	131.79	1.55	0.00	06/04/2005	216.35	108.70	96.14	100.63	07/25/2005	161.93	65.72	84.62	88.25
04/15/2005	155.02	132.56	14.09	12.50	06/05/2005	192.83	84.45	96.87	101.04	07/26/2005	178.18	74.43	92.08	96.83
04/16/2005	124.58	62.84	50.23	50.00	06/06/2005	204.70	95.65	97.55	102.56	07/27/2005	159.99	60.05	88.19	91.67
04/17/2005	125.97	64.13	50.35	50.00	06/07/2005	187.73	77.63	98.61	103.75	07/28/2005	158.53	61.93	85.01	89.04
04/18/2005	127.60	65.72	50.39	50.00	06/08/2005	183.09	74.72	96.87	101.16	07/29/2005	165.69	66.97	87.21	90.50
04/19/2005	144.49	76.67	56.33	56.67	06/09/2005	208.53	101.03	96.03	99.36	07/30/2005	174.27	74.08	88.69	92.97
04/20/2005	128.54	40.41	76.65	76.67	06/10/2005	196.78	93.20	92.09	94.79	07/31/2005	183.22	83.69	88.84	93.18
04/21/2005	129.90	43.18	75.20	75.00	06/11/2005	196.91	96.66	88.75	91.67	08/01/2005	178.54	76.67	90.39	93.75
04/22/2005	175.56	89.16	74.90	75.00	06/12/2005	182.66	80.68	90.50	93.27	08/02/2005	171.37	70.33	89.51	92.70
04/23/2005	150.46	63.98	74.98	75.00	06/13/2005	175.92	70.13	94.30	98.26	08/03/2005	142.97	46.96	84.53	86.90
04/24/2005	143.51	57.00	75.00	75.00	06/14/2005	188.71	82.28	94.95	97.52	08/04/2005	138.27	46.70	80.07	82.48
04/25/2005	129.07	41.35	76.20	77.08	06/15/2005	177.47	70.97	95.01	99.11	08/05/2005	138.83	46.53	80.83	83.30
04/26/2005	180.42	88.89	80.04	81.67	06/16/2005	186.70	79.65	95.57	98.30	08/06/2005	152.59	54.96	86.13	89.76
04/27/2005	193.27	101.02	80.75	82.08	06/17/2005	190.99	87.77	91.72	95.00	08/07/2005	141.58	47.57	82.51	84.73
04/28/2005	201.98	111.71	78.76	79.58	06/18/2005	181.68	77.65	92.54	95.63	08/08/2005	150.57	54.49	84.60	87.17
04/29/2005	170.74	79.24	79.82	81.67	06/19/2005	155.21	51.48	91.95	93.33	08/09/2005	141.62	49.87	80.24	82.38
04/30/2005	170.63	77.73	81.39	84.17	06/20/2005	197.50	94.63	91.37	93.92	08/10/2005	142.84	49.13	82.20	84.62
05/01/2005	167.73	76.14	80.10	82.08	06/21/2005	186.73	88.13	86.80	88.75	08/11/2005	151.19	50.93	88.76	90.11
05/02/2005	191.68	102.84	77.35	78.54	06/22/2005	198.73	100.90	86.33	89.17	08/12/2005	146.20	42.89	91.80	94.16
05/03/2005	180.49	92.62	76.37	77.29	06/23/2005	224.84	122.18	91.19	94.58	08/13/2005	132.57	42.19	78.89	80.61
05/04/2005	186.40	100.32	74.59	71.67	06/24/2005	198.84	94.76	92.58	96.67	08/14/2005	124.30	34.07	78.72	79.99
05/05/2005	192.24	115.62	65.13	65.00	06/25/2005	212.06	107.44	93.14	97.29	08/15/2005	129.20	42.54	75.16	76.58
05/06/2005	198.83	122.39	64.93	65.00	06/26/2005	200.28	97.81	90.96	98.96	08/16/2005	123.83	36.84	75.50	76.52
05/07/2005	202.54	124.20	66.83	66.88	06/27/2005	201.55	94.59	95.40	100.00	08/17/2005	140.41	45.94	82.97	86.75
05/08/2005	220.37	135.74	73.13	73.75	06/28/2005	197.86	90.15	96.22	100.30	08/18/2005	154.23	54.95	87.80	93.59
05/09/2005	232.16	142.52	78.15	79.38	06/29/2005	193.78	85.25	97.04	101.30	08/19/2005	146.62	50.12	85.00	89.83
05/10/2005	236.68	142.49	82.69	86.04	06/30/2005	207.05	98.45	97.12	101.53	08/20/2005	132.84	41.30	80.02	82.77
05/11/2005	258.99	159.43	88.33	89.79	07/01/2005	210.45	101.84	97.13	101.67	08/21/2005	116.78	30.32	74.94	74.64
05/12/2005	282.30	180.69	90.20	92.71	07/02/2005	210.32	101.81	97.02	101.67	08/22/2005	129.30	41.02	76.76	80.79
05/13/2005	240.17	136.74	91.93	93.75	07/03/2005	182.29	73.74	97.05	100.91	08/23/2005	139.17	43.67	83.91	89.35
05/14/2005	242.30	139.68	91.54	93.75	07/04/2005	153.77	50.33	91.93	93.83	08/24/2005	141.18	41.44	88.23	90.49
05/15/2005	241.71	140.61	90.85	92.92	07/05/2005	175.73	77.59	86.64	90.06	08/25/2005	121.28	30.54	79.24	79.11
05/16/2005	243.10	142.22	89.38	91.88	07/06/2005	172.73	73.40	87.82	89.18	08/26/2005	117.69	30.65	75.54	75.48
05/17/2005	251.70	150.97	89.22	92.71	07/07/2005	155.71	59.91	84.30	88.18	08/27/2005	126.71	39.65	75.57	77.88
05/18/2005	287.64	187.15	88.98	92.92	07/08/2005	196.27	90.31	94.46	99.60	08/28/2005	122.15	36.17	74.47	75.44
05/19/2005	290.77	192.44	86.81	90.21	07/09/2005	180.87	74.41	94.99	98.61	08/29/2005	114.75	29.97	73.28	72.71
05/20/2005	265.79	169.27	85.03	88.13	07/10/2005	175.70	72.27	91.95	96.07	08/30/2005	138.83	45.14	82.19	85.60
05/21/2005	280.80	183.59	85.71	88.96	07/11/2005	178.37	74.55	92.34	95.95	08/31/2005	123.05	35.05	77.35	77.88

TABLE F-2
BiOp Spill at The Dalles

Date	Outflow	Generation Flow	Actual Spill	BiOp Spill	Date	Outflow	Generation Flow	Actual Spill	BiOp Spill	Date	Outflow	Generation Flow	Actual Spill	BiOp Spill
04/01/2005	146.03	143.39	0.00	0.00	05/22/2005	256.71	169.80	80.70	84.00	07/12/2005	165.18	94.57	64.53	65.72
04/02/2005	143.40	137.25	0.00	0.00	05/23/2005	260.19	173.25	80.60	83.83	07/13/2005	171.69	98.77	66.65	68.68
04/03/2005	121.84	115.63	0.00	0.00	05/24/2005	246.45	162.36	77.94	81.73	07/14/2005	188.84	110.26	72.12	74.58
04/04/2005	124.76	118.55	0.00	0.00	05/25/2005	227.24	144.75	76.03	83.66	07/15/2005	199.37	118.67	74.61	77.79
04/05/2005	149.51	143.42	0.00	0.00	05/26/2005	246.25	170.69	69.40	82.66	07/16/2005	186.20	107.69	72.43	74.48
04/06/2005	169.23	163.01	0.00	0.00	05/27/2005	252.50	176.76	69.53	80.79	07/17/2005	187.72	106.19	75.26	75.09
04/07/2005	133.56	127.36	0.04	0.00	05/28/2005	267.09	188.13	72.88	81.21	07/18/2005	162.35	94.28	61.87	64.23
04/08/2005	119.44	113.10	0.00	0.00	05/29/2005	218.89	143.31	69.43	81.38	07/19/2005	156.03	88.59	61.29	62.41
04/09/2005	109.10	103.01	0.00	0.00	05/30/2005	174.76	99.68	68.88	69.91	07/20/2005	143.21	78.20	58.74	57.29
04/10/2005	124.91	118.70	0.00	0.00	05/31/2005	181.82	106.86	68.87	71.59	07/21/2005	172.91	100.29	66.34	66.58
04/11/2005	130.35	96.24	27.96	31.20	06/01/2005	212.93	137.22	69.49	80.36	07/22/2005	173.71	99.26	68.05	68.94
04/12/2005	140.37	80.39	53.83	56.15	06/02/2005	229.47	153.29	69.78	82.09	07/23/2005	151.45	87.95	57.35	59.42
04/13/2005	147.88	83.90	57.58	59.02	06/03/2005	213.52	137.92	69.51	80.87	07/24/2005	132.78	72.20	54.30	53.11
04/14/2005	131.71	73.43	52.13	52.68	06/04/2005	228.08	154.16	67.77	78.31	07/25/2005	163.63	94.80	62.68	63.30
04/15/2005	145.54	83.56	55.71	58.22	06/05/2005	163.56	94.11	63.18	65.43	07/26/2005	167.75	95.51	65.90	65.71
04/16/2005	114.05	63.77	44.06	45.62	06/06/2005	202.52	130.56	65.68	76.55	07/27/2005	148.99	84.73	57.80	59.60
04/17/2005	118.64	66.03	46.33	47.46	06/07/2005	170.83	100.78	64.02	67.80	07/28/2005	154.48	88.12	60.03	61.79
04/18/2005	117.04	66.25	44.46	46.77	06/08/2005	173.55	102.80	64.35	68.85	07/29/2005	160.09	90.15	63.60	64.04
04/19/2005	126.26	70.03	50.21	50.27	06/09/2005	205.11	129.16	69.80	81.11	07/30/2005	160.11	89.56	64.33	64.04
04/20/2005	126.99	71.11	49.54	50.71	06/10/2005	182.68	110.23	66.36	72.27	07/31/2005	181.69	106.18	69.43	70.01
04/21/2005	119.48	67.47	45.79	47.67	06/11/2005	195.92	120.50	69.49	76.43	08/01/2005	164.43	92.30	65.98	65.77
04/22/2005	164.98	93.38	65.39	65.99	06/12/2005	158.46	90.22	62.09	63.39	08/02/2005	166.93	95.99	64.60	66.77
04/23/2005	140.49	80.02	54.26	56.20	06/13/2005	163.92	94.23	63.60	65.57	08/03/2005	129.69	70.03	53.27	51.88
04/24/2005	124.16	70.23	47.65	49.66	06/14/2005	177.08	104.63	66.30	70.83	08/04/2005	132.41	70.41	55.78	52.96
04/25/2005	127.50	71.32	49.84	50.98	06/15/2005	185.18	116.10	62.87	70.85	08/05/2005	129.64	71.17	52.33	51.86
04/26/2005	178.23	108.75	63.33	71.29	06/16/2005	166.87	98.63	62.09	66.51	08/06/2005	140.69	74.42	60.25	56.28
04/27/2005	176.51	106.38	63.93	70.60	06/17/2005	175.34	106.19	63.06	68.24	08/07/2005	127.82	68.06	53.36	51.13
04/28/2005	191.68	118.41	66.93	76.67	06/18/2005	186.98	113.36	67.60	74.04	08/08/2005	150.86	85.52	59.20	60.35
04/29/2005	158.77	89.52	62.98	63.51	06/19/2005	136.78	76.89	53.68	54.71	08/09/2005	123.40	68.92	48.27	49.24
04/30/2005	164.50	93.85	64.49	65.80	06/20/2005	180.16	110.87	63.08	70.00	08/10/2005	141.93	81.98	53.62	55.94
05/01/2005	157.57	89.08	62.21	63.03	06/21/2005	176.59	121.77	48.49	68.15	08/11/2005	137.21	76.29	54.65	54.89
05/02/2005	177.37	101.11	70.04	70.95	06/22/2005	193.65	119.88	67.50	75.31	08/12/2005	123.21	68.24	48.76	49.29
05/03/2005	177.04	101.60	69.35	70.82	06/23/2005	222.88	142.54	74.26	76.78	08/13/2005	129.60	73.19	50.20	51.84
05/04/2005	173.25	97.53	69.38	69.30	06/24/2005	197.23	119.61	71.47	73.44	08/14/2005	102.12	56.51	39.39	40.85
05/05/2005	186.13	107.32	72.41	74.45	06/25/2005	204.51	130.72	67.64	77.75	08/15/2005	119.90	68.15	45.66	47.92
05/06/2005	189.70	118.34	65.09	63.78	06/26/2005	185.32	107.35	71.81	74.11	08/16/2005	120.17	68.32	45.58	47.81
05/07/2005	192.98	126.69	59.89	60.00	06/27/2005	203.52	126.12	72.18	74.58	08/17/2005	142.87	82.09	54.32	57.09
05/08/2005	206.15	133.85	66.03	67.86	06/28/2005	179.47	103.05	70.21	70.01	08/18/2005	137.95	77.89	53.73	54.91
05/09/2005	236.40	150.28	79.78	80.00	06/29/2005	192.48	114.06	72.20	73.45	08/19/2005	141.46	79.53	55.66	56.58
05/10/2005	225.43	141.71	77.56	77.86	06/30/2005	198.96	122.83	69.66	69.81	08/20/2005	120.63	66.57	47.72	48.25
05/11/2005	252.75	166.04	80.38	80.00	07/01/2005	206.76	131.03	69.52	71.22	08/21/2005	108.88	60.41	42.31	43.54
05/12/2005	262.31	175.64	80.15	79.86	07/02/2005	191.92	111.75	73.90	76.30	08/22/2005	123.99	69.76	47.95	49.57
05/13/2005	240.80	154.40	80.18	79.43	07/03/2005	170.59	95.98	68.34	67.98	08/23/2005	134.08	76.98	50.89	53.63
05/14/2005	236.60	151.16	79.23	78.86	07/04/2005	133.33	73.83	53.35	53.33	08/24/2005	123.65	68.87	48.57	49.46
05/15/2005	223.91	138.26	79.50	79.32	07/05/2005	184.39	109.44	68.74	69.81	08/25/2005	113.55	62.20	44.95	45.41
05/16/2005	222.34	136.19	79.71	79.30	07/06/2005	147.04	80.18	60.65	58.64	08/26/2005	108.53	61.40	40.98	43.41
05/17/2005	255.78	168.32	81.18	81.69	07/07/2005	163.81	93.55	64.05	65.10	08/27/2005	120.98	68.00	46.76	48.39
05/18/2005	286.48	200.52	79.56	84.00	07/08/2005	172.45	97.02	69.29	68.58	08/28/2005	117.39	64.72	46.45	46.96
05/19/2005	260.29	174.31	79.70	84.00	07/09/2005	187.62	108.02	73.80	74.86	08/29/2005	106.37	58.35	41.93	42.29
05/20/2005	255.02	167.77	81.10	84.00	07/10/2005	164.42	94.20	64.00	65.77	08/30/2005	129.80	73.29	50.36	51.91
05/21/2005	270.69	183.52	81.00	83.88	07/11/2005	168.79	95.23	67.41	67.41	08/31/2005	114.63	63.88	44.48	45.85

TABLE F-3

BiOp Spill at John Day

Date	Outflow	Generation Flow	Actual Spill	BiOp Spill	Date	Outflow	Generation Flow	Actual Spill	BiOp Spill	Date	Outflow	Generation Flow	Actual Spill	BiOp Spill
04/01/2005	135.55	134.63	0.00	0.00	05/22/2005	262.31	163.45	97.35	86.25	07/12/2005	166.44	115.30	49.82	49.93
04/02/2005	142.58	141.43	0.00	0.00	05/23/2005	265.93	172.52	92.06	95.78	07/13/2005	176.30	121.77	53.23	52.89
04/03/2005	115.57	114.56	0.00	0.00	05/24/2005	252.08	154.89	95.89	93.54	07/14/2005	196.64	135.88	59.31	58.99
04/04/2005	121.61	120.53	0.00	0.00	05/25/2005	222.25	132.35	88.30	93.61	07/15/2005	205.83	142.25	62.47	61.75
04/05/2005	150.04	149.03	0.00	0.00	05/26/2005	255.80	149.99	104.36	106.74	07/16/2005	192.23	133.09	57.93	57.67
04/06/2005	167.20	166.20	0.00	0.00	05/27/2005	254.39	153.78	99.34	106.19	07/17/2005	188.82	131.98	55.52	56.65
04/07/2005	127.39	126.24	0.00	0.00	05/28/2005	276.85	167.93	107.55	117.21	07/18/2005	172.35	119.95	51.23	51.70
04/08/2005	117.05	115.53	0.00	0.00	05/29/2005	220.89	123.58	95.93	97.68	07/19/2005	152.75	105.13	46.35	45.83
04/09/2005	105.16	103.78	0.00	0.00	05/30/2005	177.48	100.57	75.59	75.71	07/20/2005	148.88	102.63	45.04	44.67
04/10/2005	125.45	103.05	21.11	21.42	05/31/2005	181.48	140.04	40.30	43.29	07/21/2005	180.15	124.42	54.22	53.98
04/11/2005	125.41	84.63	39.63	40.83	06/01/2005	222.40	155.78	65.25	64.52	07/22/2005	175.80	121.44	52.92	52.74
04/12/2005	141.66	102.37	37.23	40.18	06/02/2005	231.39	160.05	69.80	68.98	07/23/2005	155.78	108.03	46.38	46.74
04/13/2005	139.10	98.52	39.04	40.26	06/03/2005	212.64	151.63	59.92	59.91	07/24/2005	133.47	92.11	39.86	40.04
04/14/2005	135.00	96.50	37.06	37.74	06/04/2005	229.55	172.38	55.94	55.30	07/25/2005	173.47	121.71	52.18	52.04
04/15/2005	148.22	103.36	43.41	44.02	06/05/2005	163.66	110.39	51.84	52.10	07/26/2005	170.68	118.34	50.96	51.21
04/16/2005	111.83	78.59	31.80	33.14	06/06/2005	203.64	150.61	51.67	52.27	07/27/2005	152.26	104.96	45.77	45.68
04/17/2005	116.99	82.03	33.50	34.87	06/07/2005	174.69	129.50	44.09	43.40	07/28/2005	154.07	107.20	45.35	46.22
04/18/2005	118.89	90.53	26.68	28.06	06/08/2005	184.85	136.08	47.41	46.75	07/29/2005	166.14	114.95	49.81	49.84
04/19/2005	121.28	93.29	26.64	27.89	06/09/2005	202.96	147.10	54.48	55.48	07/30/2005	164.90	114.42	49.16	49.47
04/20/2005	128.62	96.39	30.79	32.39	06/10/2005	187.00	132.13	53.72	53.74	07/31/2005	184.40	127.03	55.33	55.32
04/21/2005	124.11	85.82	36.75	37.50	06/11/2005	189.16	135.28	52.58	53.43	08/01/2005	171.90	119.38	51.44	51.57
04/22/2005	166.45	108.95	56.19	53.27	06/12/2005	164.02	116.66	45.98	45.41	08/02/2005	169.95	117.98	50.62	50.99
04/23/2005	140.52	96.83	42.25	42.42	06/13/2005	164.14	119.63	43.35	44.00	08/03/2005	126.23	87.08	37.75	37.87
04/24/2005	119.69	85.05	32.90	32.86	06/14/2005	174.68	124.90	48.67	48.72	08/04/2005	138.18	95.72	41.08	41.45
04/25/2005	132.00	97.78	32.83	33.06	06/15/2005	189.33	142.51	45.59	45.97	08/05/2005	136.65	94.66	40.69	40.99
04/26/2005	183.06	134.84	46.85	47.67	06/16/2005	172.00	130.18	40.53	41.93	08/06/2005	142.50	98.60	42.44	42.75
04/27/2005	175.31	129.83	43.82	48.00	06/17/2005	177.90	135.36	41.32	41.26	08/07/2005	132.19	91.04	39.84	39.66
04/28/2005	189.94	133.97	54.42	54.47	06/18/2005	191.13	137.92	52.09	51.54	08/08/2005	151.27	104.55	45.50	45.38
04/29/2005	161.15	112.28	47.56	47.63	06/19/2005	139.56	100.04	38.07	38.44	08/09/2005	126.25	87.64	37.52	37.88
04/30/2005	164.59	115.75	47.48	48.08	06/20/2005	178.93	136.45	41.11	41.79	08/10/2005	144.60	100.14	43.10	43.38
05/01/2005	161.88	113.90	46.42	47.23	06/21/2005	177.85	114.14	62.50	62.97	08/11/2005	140.51	95.21	42.02	42.15
05/02/2005	178.63	126.63	50.68	51.44	06/22/2005	203.78	142.83	59.60	61.14	08/12/2005	125.48	85.97	38.35	37.64
05/03/2005	175.05	123.45	50.29	50.75	06/23/2005	230.28	160.37	68.76	69.06	08/13/2005	133.69	91.97	40.50	40.11
05/04/2005	178.58	125.32	51.73	52.01	06/24/2005	201.81	140.35	60.17	60.48	08/14/2005	107.20	74.27	31.62	32.16
05/05/2005	184.91	141.68	41.64	41.78	06/25/2005	213.46	148.10	63.85	64.04	08/15/2005	118.91	81.86	35.45	35.67
05/06/2005	190.33	149.95	39.01	40.00	06/26/2005	186.83	129.45	56.17	56.05	08/16/2005	127.29	88.10	37.80	38.19
05/07/2005	196.43	154.75	40.15	40.00	06/27/2005	212.70	147.70	63.78	63.43	08/17/2005	143.95	99.33	43.32	43.19
05/08/2005	203.51	161.56	40.50	40.00	06/28/2005	177.73	124.36	52.22	53.32	08/18/2005	143.20	99.51	42.27	42.96
05/09/2005	239.95	197.23	41.23	41.25	06/29/2005	194.48	135.58	58.18	58.35	08/19/2005	146.44	101.46	43.75	43.93
05/10/2005	224.77	180.68	42.53	42.50	06/30/2005	200.45	140.05	59.33	59.36	08/20/2005	121.05	83.73	36.25	36.31
05/11/2005	253.56	196.42	55.69	56.25	07/01/2005	213.98	149.10	63.50	63.20	08/21/2005	107.97	74.30	32.35	32.39
05/12/2005	258.85	188.78	68.33	68.26	07/02/2005	198.73	137.58	59.62	59.62	08/22/2005	128.51	88.92	38.53	38.55
05/13/2005	242.44	176.00	64.99	64.27	07/03/2005	177.52	123.48	52.93	53.26	08/23/2005	137.80	93.13	41.11	41.29
05/14/2005	240.08	173.72	65.14	64.75	07/04/2005	133.34	91.78	40.04	40.00	08/24/2005	128.70	89.35	38.06	38.61
05/15/2005	230.13	167.05	61.47	61.39	07/05/2005	194.73	135.20	58.23	58.42	08/25/2005	114.53	78.04	35.05	34.36
05/16/2005	216.80	155.03	60.47	60.87	07/06/2005	139.88	97.66	41.05	41.97	08/26/2005	105.17	73.18	30.78	31.55
05/17/2005	258.88	193.76	63.78	61.42	07/07/2005	172.29	119.75	50.90	51.69	08/27/2005	130.38	91.07	38.10	39.11
05/18/2005	286.31	203.97	80.96	64.17	07/08/2005	181.36	126.34	53.59	54.41	08/28/2005	118.96	82.37	35.35	35.69
05/19/2005	259.17	194.11	63.61	64.17	07/09/2005	188.99	131.01	56.83	56.70	08/29/2005	108.91	74.98	32.54	32.67
05/20/2005	258.10	181.75	75.04	51.67	07/10/2005	165.73	114.71	49.54	49.72	08/30/2005	135.34	92.95	41.08	40.60
05/21/2005	271.43	222.67	47.23	36.67	07/11/2005	170.08	117.01	51.96	51.02	08/31/2005	115.75	79.62	35.03	34.72

TABLE F-4

BiOp Spill at McNary

Date	Outflow	Generation Flow	Actual Spill	BiOp Spill	Date	Outflow	Generation Flow	Actual Spill	BiOp Spill	Date	Outflow	Generation Flow	Actual Spill	BiOp Spill
04/01/2005	123.72	109.67	9.34	0.00	05/22/2005	263.84	85.24	173.89	90.00	07/12/2005	198.79	50.09	144.02	147.70
04/02/2005	134.89	109.25	20.94	0.00	05/23/2005	251.31	139.07	107.53	108.75	07/13/2005	188.56	50.88	132.97	137.68
04/03/2005	126.92	108.85	13.37	0.00	05/24/2005	255.50	165.78	85.03	85.00	07/14/2005	201.60	49.78	147.12	151.82
04/04/2005	125.18	109.11	11.37	0.00	05/25/2005	237.74	160.80	72.23	66.25	07/15/2005	214.42	50.42	159.29	164.00
04/05/2005	153.93	115.60	33.63	0.00	05/26/2005	247.92	140.15	103.07	90.00	07/16/2005	202.98	50.34	147.93	152.64
04/06/2005	161.77	137.70	19.38	0.00	05/27/2005	258.91	143.72	110.48	108.53	07/17/2005	198.56	50.82	143.03	147.75
04/07/2005	134.93	130.23	0.00	0.00	05/28/2005	283.83	170.27	108.84	85.00	07/18/2005	178.39	50.72	122.97	127.67
04/08/2005	117.58	112.88	0.00	0.00	05/29/2005	219.66	133.64	81.31	85.00	07/19/2005	170.85	50.51	115.65	120.34
04/09/2005	111.70	107.00	0.00	0.00	05/30/2005	191.70	101.53	85.47	85.00	07/20/2005	166.84	49.87	112.28	116.97
04/10/2005	111.51	89.06	17.75	17.78	05/31/2005	192.95	122.94	65.31	66.25	07/21/2005	193.85	49.95	139.21	143.90
04/11/2005	126.64	86.14	35.80	36.40	06/01/2005	221.65	125.53	91.41	92.50	07/22/2005	187.05	50.48	131.87	136.56
04/12/2005	134.13	94.92	34.51	36.57	06/02/2005	230.58	130.06	95.84	95.98	07/23/2005	159.37	50.41	104.25	108.95
04/13/2005	127.08	86.41	35.95	38.05	06/03/2005	218.79	111.53	102.57	94.91	07/24/2005	153.12	50.21	98.21	102.91
04/14/2005	140.51	93.50	42.30	43.64	06/04/2005	225.45	122.60	98.15	101.86	07/25/2005	177.86	50.74	122.40	127.12
04/15/2005	143.89	94.60	44.59	49.08	06/05/2005	188.69	98.68	85.31	85.00	07/26/2005	174.20	50.80	118.70	123.40
04/16/2005	122.36	86.60	31.06	34.23	06/06/2005	195.03	126.75	63.56	64.57	07/27/2005	173.90	49.93	119.27	123.97
04/17/2005	116.68	84.63	27.34	28.05	06/07/2005	182.99	107.55	70.72	71.72	07/28/2005	163.50	49.53	109.27	113.97
04/18/2005	122.38	93.00	24.69	27.12	06/08/2005	186.00	101.55	79.74	80.12	07/29/2005	188.20	49.78	133.73	136.65
04/19/2005	119.89	89.70	25.48	26.96	06/09/2005	205.27	109.14	91.44	91.25	07/30/2005	176.91	50.37	121.85	125.01
04/20/2005	121.18	90.93	25.55	27.70	06/10/2005	204.19	113.81	85.70	85.00	07/31/2005	197.64	48.34	144.62	146.51
04/21/2005	142.55	92.46	45.38	46.38	06/11/2005	195.80	112.51	78.60	79.05	08/01/2005	184.24	48.87	130.68	135.23
04/22/2005	160.85	91.27	64.87	65.86	06/12/2005	173.86	108.05	61.10	62.82	08/02/2005	167.41	50.64	112.06	116.78
04/23/2005	144.98	95.05	45.24	45.63	06/13/2005	168.91	109.57	54.63	54.76	08/03/2005	138.98	50.53	83.73	88.45
04/24/2005	121.83	86.33	30.81	33.63	06/14/2005	175.27	103.49	67.09	66.95	08/04/2005	144.97	50.09	90.17	94.88
04/25/2005	138.04	58.31	75.05	75.77	06/15/2005	179.73	111.81	63.21	63.68	08/05/2005	154.99	49.77	100.53	104.71
04/26/2005	183.83	95.15	83.98	85.00	06/16/2005	185.04	112.38	67.96	69.50	08/06/2005	175.17	49.40	121.09	125.77
04/27/2005	181.07	94.71	81.68	85.00	06/17/2005	191.92	111.01	76.19	76.79	08/07/2005	149.18	49.70	94.77	99.47
04/28/2005	195.78	105.98	85.08	85.00	06/18/2005	195.45	111.53	79.23	78.98	08/08/2005	160.17	51.28	104.20	108.89
04/29/2005	164.19	113.71	45.77	47.57	06/19/2005	137.37	96.64	36.02	35.71	08/09/2005	135.12	50.64	79.77	84.47
04/30/2005	166.82	115.36	46.76	60.65	06/20/2005	184.10	107.78	71.63	71.69	08/10/2005	160.39	49.99	105.71	110.40
05/01/2005	171.55	104.84	62.00	64.81	06/21/2005	202.52	111.57	86.26	86.26	08/11/2005	152.19	50.60	96.88	101.59
05/02/2005	162.85	100.74	57.42	58.78	06/22/2005	203.39	141.83	56.86	56.86	08/12/2005	149.97	50.97	94.30	99.00
05/03/2005	179.83	87.60	87.54	91.67	06/23/2005	218.06	161.66	51.72	51.72	08/13/2005	137.45	51.00	81.75	86.45
05/04/2005	195.26	105.60	84.95	85.00	06/24/2005	220.53	169.42	46.43	46.43	08/14/2005	122.35	50.20	67.32	72.15
05/05/2005	192.42	105.25	82.47	85.00	06/25/2005	213.88	172.08	37.10	37.10	08/15/2005	127.86	49.67	73.50	78.20
05/06/2005	201.64	111.95	85.01	85.00	06/26/2005	200.55	171.30	24.54	24.54	08/16/2005	145.92	49.48	91.74	96.44
05/07/2005	199.87	132.72	62.45	63.46	06/27/2005	196.08	171.57	19.82	19.82	08/17/2005	156.99	49.87	102.41	107.13
05/08/2005	201.64	115.65	81.29	82.68	06/28/2005	188.93	163.79	20.47	20.47	08/18/2005	158.23	50.07	103.47	108.15
05/09/2005	228.78	130.13	93.95	97.88	06/29/2005	184.68	159.32	20.65	20.65	08/19/2005	151.26	50.85	95.74	100.42
05/10/2005	242.54	152.75	85.10	85.00	06/30/2005	215.48	168.94	41.83	41.83	08/20/2005	134.53	50.75	79.02	83.77
05/11/2005	259.99	148.89	106.41	66.25	07/01/2005	230.14	50.18	175.27	175.00	08/21/2005	125.11	50.76	69.67	74.35
05/12/2005	254.81	121.42	128.68	90.00	07/02/2005	203.25	50.00	148.56	152.04	08/22/2005	143.15	50.22	88.23	92.94
05/13/2005	247.52	137.63	105.18	108.63	07/03/2005	184.86	50.03	130.13	134.83	08/23/2005	153.02	50.20	98.13	102.82
05/14/2005	238.56	148.50	85.38	85.00	07/04/2005	153.44	50.00	98.74	103.44	08/24/2005	144.28	50.27	89.29	94.01
05/15/2005	242.44	159.04	78.71	66.25	07/05/2005	204.24	51.36	148.18	152.30	08/25/2005	128.24	50.05	73.49	78.19
05/16/2005	221.29	127.89	88.71	89.61	07/06/2005	147.24	51.27	91.26	95.97	08/26/2005	121.64	49.84	67.09	71.80
05/17/2005	246.43	132.20	109.54	89.72	07/07/2005	191.42	51.54	135.17	139.88	08/27/2005	145.32	50.45	90.18	94.87
05/18/2005	277.51	154.64	118.17	90.00	07/08/2005	207.05	50.41	151.93	155.01	08/28/2005	133.42	50.43	78.29	82.99
05/19/2005	256.95	144.71	107.55	108.75	07/09/2005	197.74	50.08	142.94	147.66	08/29/2005	125.46	50.09	70.67	75.37
05/20/2005	254.58	163.94	85.93	85.00	07/10/2005	172.77	50.13	117.93	122.64	08/30/2005	150.19	49.76	95.74	100.43
05/21/2005	290.48	149.78	135.98	66.25	07/11/2005	186.56	50.23	131.65	136.33	08/31/2005	113.70	49.62	59.38	64.08

TABLE F-5

BiOp Spill at Ice Harbor

Date	Outflow	Generation Flow	Actual Spill	BiOp Spill	Date	Outflow	Generation Flow	Actual Spill	BiOp Spill	Date	Outflow	Generation Flow	Actual Spill	BiOp Spill
04/01/2005	32.37	31.75	0.00	0.00	05/22/2005	128.06	68.03	59.09	39.15	07/12/2005	37.25	19.62	16.88	16.73
04/02/2005	44.01	43.33	0.00	0.00	05/23/2005	118.48	79.75	37.80	36.38	07/13/2005	33.67	16.28	16.39	16.43
04/03/2005	35.00	34.43	0.00	0.00	05/24/2005	118.92	80.18	37.80	37.86	07/14/2005	39.01	22.40	15.80	15.80
04/04/2005	32.62	31.10	0.20	4.13	05/25/2005	105.55	31.29	73.26	74.93	07/15/2005	33.20	16.46	15.80	15.80
04/05/2005	44.00	40.02	3.17	4.13	05/26/2005	106.01	19.60	85.41	83.97	07/16/2005	39.54	12.27	26.02	27.58
04/06/2005	41.22	37.31	2.91	4.13	05/27/2005	91.18	9.71	80.48	78.20	07/17/2005	30.23	9.45	19.81	20.73
04/07/2005	40.49	26.71	13.04	16.12	05/28/2005	90.60	8.81	80.67	79.23	07/18/2005	38.10	9.37	28.01	28.60
04/08/2005	38.97	14.98	23.24	24.23	05/29/2005	90.38	47.32	42.12	38.41	07/19/2005	31.86	9.26	21.68	22.36
04/09/2005	42.23	14.28	26.94	22.10	05/30/2005	81.99	53.53	27.53	27.53	07/20/2005	36.02	17.19	18.08	17.89
04/10/2005	45.43	12.85	31.63	26.57	05/31/2005	79.15	22.61	55.80	60.77	07/21/2005	33.71	16.91	15.80	15.80
04/11/2005	54.79	25.81	28.46	21.85	06/01/2005	91.20	6.38	84.05	81.66	07/22/2005	34.59	12.98	20.85	22.21
04/12/2005	51.05	23.85	26.26	25.72	06/02/2005	95.11	50.02	44.40	40.52	07/23/2005	34.01	9.45	23.62	24.51
04/13/2005	45.35	19.83	24.90	20.45	06/03/2005	89.07	60.87	27.57	27.53	07/24/2005	30.51	9.44	20.17	21.01
04/14/2005	41.30	17.84	22.65	20.52	06/04/2005	80.67	54.09	25.77	25.76	07/25/2005	25.30	9.40	15.10	15.80
04/15/2005	41.73	19.46	21.58	16.51	06/05/2005	73.73	49.85	23.19	23.28	07/26/2005	30.55	9.08	20.65	21.05
04/16/2005	35.40	13.85	20.73	16.14	06/06/2005	77.34	14.72	61.83	62.50	07/27/2005	30.33	9.05	20.32	20.83
04/17/2005	42.64	13.85	28.11	23.72	06/07/2005	73.91	6.56	66.59	64.41	07/28/2005	28.27	9.36	17.91	18.77
04/18/2005	47.51	11.10	35.72	35.91	06/08/2005	64.20	32.84	30.61	27.92	07/29/2005	33.74	9.40	23.67	24.24
04/19/2005	46.87	11.30	34.57	33.92	06/09/2005	63.34	39.61	22.98	22.45	07/30/2005	38.08	9.40	27.80	28.57
04/20/2005	46.28	10.10	35.36	36.57	06/10/2005	57.82	12.90	44.16	44.26	07/31/2005	31.40	9.39	21.20	21.90
04/21/2005	43.96	8.37	34.83	35.74	06/11/2005	51.20	6.53	43.11	41.70	08/01/2005	29.32	9.41	19.16	19.82
04/22/2005	41.58	7.61	33.22	32.57	06/12/2005	52.82	26.80	24.88	22.57	08/02/2005	35.90	9.48	25.68	26.40
04/23/2005	43.27	6.56	35.83	37.56	06/13/2005	50.86	31.35	18.45	17.67	08/03/2005	28.08	9.24	17.92	18.58
04/24/2005	41.45	6.20	34.38	36.23	06/14/2005	53.30	14.89	37.48	38.86	08/04/2005	25.40	9.45	15.12	15.90
04/25/2005	49.61	6.86	41.81	40.50	06/15/2005	52.62	6.77	44.99	43.12	08/05/2005	28.86	9.45	18.62	19.36
04/26/2005	53.79	14.06	38.98	44.29	06/16/2005	44.97	6.58	37.50	35.47	08/06/2005	36.32	9.50	25.97	26.82
04/27/2005	54.34	35.11	18.41	18.59	06/17/2005	47.44	7.05	39.50	37.94	08/07/2005	35.03	9.33	25.01	25.53
04/28/2005	55.56	36.13	18.18	19.03	06/18/2005	52.04	27.50	23.53	21.36	08/08/2005	28.36	9.33	18.35	18.86
04/29/2005	53.52	35.19	17.58	17.97	06/19/2005	54.19	34.59	18.66	18.72	08/09/2005	29.43	9.31	19.48	19.93
04/30/2005	54.94	35.13	19.06	18.92	06/20/2005	53.19	21.23	31.02	19.34	08/10/2005	27.77	9.40	17.30	18.27
05/01/2005	55.53	13.38	41.27	41.94	06/21/2005	51.34	8.95	41.46	17.67	08/11/2005	33.47	10.02	22.73	23.97
05/02/2005	49.39	5.48	43.17	39.89	06/22/2005	53.19	7.55	44.76	41.94	08/12/2005	21.63	10.09	10.84	12.13
05/03/2005	51.08	6.81	43.28	41.57	06/23/2005	46.98	9.40	36.70	37.48	08/13/2005	23.48	9.30	13.55	13.98
05/04/2005	50.30	6.26	43.10	40.80	06/24/2005	46.47	12.19	33.28	23.63	08/14/2005	23.78	9.29	13.81	14.28
05/05/2005	62.06	37.93	23.05	21.59	06/25/2005	48.42	27.99	19.34	19.34	08/15/2005	24.48	10.31	13.40	14.98
05/06/2005	65.74	42.68	22.06	22.09	06/26/2005	39.92	12.27	26.60	27.63	08/16/2005	21.54	9.42	11.40	12.04
05/07/2005	82.50	54.83	26.73	27.17	06/27/2005	45.03	9.25	34.84	35.52	08/17/2005	19.80	9.25	9.66	10.30
05/08/2005	84.01	55.33	27.68	28.24	06/28/2005	46.98	9.40	36.65	37.48	08/18/2005	26.24	9.13	16.37	16.74
05/09/2005	82.15	19.64	61.45	63.36	06/29/2005	57.57	9.47	47.05	48.07	08/19/2005	22.91	9.17	13.05	13.41
05/10/2005	93.11	8.09	84.01	82.17	06/30/2005	53.96	27.58	25.39	24.50	08/20/2005	17.46	9.17	7.33	7.96
05/11/2005	104.17	57.10	46.03	44.10	07/01/2005	52.00	31.45	19.61	19.55	08/21/2005	22.10	9.18	11.99	12.60
05/12/2005	94.20	64.08	29.18	28.95	07/02/2005	39.73	11.40	27.31	28.32	08/22/2005	14.96	9.18	5.03	5.46
05/13/2005	88.86	18.18	69.75	71.73	07/03/2005	35.39	9.40	25.11	25.89	08/23/2005	26.16	9.19	16.09	16.66
05/14/2005	89.40	6.64	81.69	79.90	07/04/2005	45.56	21.76	22.87	22.65	08/24/2005	19.94	9.18	10.00	10.44
05/15/2005	88.38	46.05	41.20	40.14	07/05/2005	40.33	21.72	17.81	18.11	08/25/2005	20.35	5.71	13.89	10.85
05/16/2005	90.96	60.60	29.30	28.95	07/06/2005	42.08	11.55	29.73	30.45	08/26/2005	20.15	9.33	10.10	10.65
05/17/2005	124.73	47.49	75.99	78.58	07/07/2005	45.44	9.31	35.20	35.94	08/27/2005	22.70	9.43	12.48	13.20
05/18/2005	123.56	30.95	91.59	92.00	07/08/2005	41.33	21.63	18.96	18.63	08/28/2005	20.25	9.45	9.85	10.75
05/19/2005	119.89	27.38	91.63	92.00	07/09/2005	38.72	21.92	15.80	15.80	08/29/2005	19.09	9.41	8.96	9.59
05/20/2005	132.55	39.68	91.75	92.00	07/10/2005	29.61	11.82	17.03	17.75	08/30/2005	24.45	9.41	14.43	14.95
05/21/2005	137.94	78.92	57.78	51.89	07/11/2005	37.94	9.05	27.89	28.44	08/31/2005	20.46	9.60	10.07	10.96

TABLE F-6

BiOp Spill at Lower Monumental

Date	Outflow	Generation Flow	Actual Spill	BiOp Spill	Date	Outflow	Generation Flow	Actual Spill	BiOp Spill	Date	Outflow	Generation Flow	Actual Spill	BiOp Spill
04/01/2005	33.15	32.36	0.00	0.00	05/22/2005	123.76	90.80	32.11	3.75	07/12/2005	37.87	15.50	21.50	21.90
04/02/2005	42.68	42.02	0.00	0.00	05/23/2005	119.56	94.44	24.34	3.75	07/13/2005	34.85	13.69	20.40	21.48
04/03/2005	36.21	35.54	0.00	0.00	05/24/2005	116.60	94.04	21.63	3.75	07/14/2005	38.77	15.18	22.80	23.33
04/04/2005	33.32	32.53	0.00	0.00	05/25/2005	102.56	92.53	9.27	3.75	07/15/2005	32.72	12.01	20.06	20.52
04/05/2005	42.42	41.51	0.00	0.00	05/26/2005	101.30	86.52	13.83	3.75	07/16/2005	37.88	15.27	21.77	22.42
04/06/2005	42.91	42.13	0.00	0.00	05/27/2005	90.97	86.94	3.11	3.75	07/17/2005	31.13	13.29	16.94	17.89
04/07/2005	39.56	38.65	0.00	0.00	05/28/2005	87.55	86.38	0.20	3.75	07/18/2005	34.14	15.60	17.70	18.80
04/08/2005	37.35	36.63	0.00	0.00	05/29/2005	89.50	87.24	1.48	7.58	07/19/2005	34.16	14.70	18.60	19.35
04/09/2005	42.27	41.55	0.00	0.00	05/30/2005	83.36	81.26	1.19	7.58	07/20/2005	33.98	12.67	20.47	20.40
04/10/2005	43.00	42.21	0.00	0.00	05/31/2005	79.20	78.23	0.12	7.58	07/21/2005	37.21	14.89	21.38	21.97
04/11/2005	52.57	51.85	0.00	0.00	06/01/2005	88.39	85.42	2.12	7.58	07/22/2005	35.35	12.95	21.70	22.00
04/12/2005	50.51	49.60	0.00	0.00	06/02/2005	94.68	91.58	2.37	7.58	07/23/2005	36.23	14.43	21.01	21.78
04/13/2005	44.78	43.93	0.00	0.00	06/03/2005	89.73	86.28	2.74	7.58	07/24/2005	29.28	12.33	16.16	16.91
04/14/2005	39.33	38.48	0.00	0.00	06/04/2005	78.57	75.43	2.33	7.58	07/25/2005	24.94	11.73	12.52	13.44
04/15/2005	40.83	40.10	0.00	0.00	06/05/2005	74.96	71.07	3.23	7.58	07/26/2005	31.03	11.71	18.37	19.53
04/16/2005	36.05	35.26	0.00	0.00	06/06/2005	77.29	75.67	0.84	7.58	07/27/2005	26.93	11.79	14.35	15.43
04/17/2005	40.66	39.69	0.00	0.00	06/07/2005	71.92	71.19	0.00	7.58	07/28/2005	29.47	11.94	16.56	17.97
04/18/2005	44.35	43.56	0.00	0.00	06/08/2005	64.04	63.13	0.00	7.58	07/29/2005	34.98	11.89	22.30	23.32
04/19/2005	45.98	45.07	0.00	0.00	06/09/2005	62.84	61.87	0.00	7.58	07/30/2005	36.85	11.85	24.34	25.11
04/20/2005	44.34	43.43	0.00	0.00	06/10/2005	56.52	55.86	0.00	0.00	07/31/2005	29.02	11.88	16.42	17.41
04/21/2005	44.19	43.40	0.00	0.00	06/11/2005	51.58	50.79	0.00	0.00	08/01/2005	30.60	11.76	18.26	19.02
04/22/2005	39.70	38.85	0.00	0.00	06/12/2005	51.00	50.22	0.00	0.00	08/02/2005	33.55	11.57	21.18	21.95
04/23/2005	40.37	39.52	0.00	0.00	06/13/2005	51.89	51.04	0.00	0.00	08/03/2005	27.78	11.78	15.04	16.27
04/24/2005	40.39	39.60	0.00	0.00	06/14/2005	53.75	52.90	0.00	0.00	08/04/2005	24.78	11.65	12.40	13.28
04/25/2005	47.21	46.43	0.00	0.00	06/15/2005	49.55	48.77	0.00	0.00	08/05/2005	28.04	11.82	15.40	16.19
04/26/2005	51.11	50.14	0.00	0.00	06/16/2005	44.61	43.88	0.00	0.00	08/06/2005	34.40	11.47	22.04	22.79
04/27/2005	54.15	53.24	0.00	0.00	06/17/2005	45.87	45.21	0.00	0.00	08/07/2005	31.64	11.48	19.45	20.14
04/28/2005	55.71	54.80	0.00	0.00	06/18/2005	52.76	52.10	0.00	0.00	08/08/2005	27.26	11.68	14.66	15.75
04/29/2005	55.85	55.06	0.00	0.00	06/19/2005	55.30	54.54	0.03	0.50	08/09/2005	31.36	11.57	19.00	19.86
04/30/2005	53.45	52.54	0.00	0.00	06/20/2005	53.83	37.66	15.37	15.92	08/10/2005	25.08	11.76	12.50	13.58
05/01/2005	54.39	53.48	0.00	0.00	06/21/2005	46.90	26.55	19.57	20.00	08/11/2005	30.63	11.57	18.40	19.13
05/02/2005	46.89	46.04	0.00	0.00	06/22/2005	51.25	31.43	19.18	19.74	08/12/2005	21.74	11.69	9.24	10.24
05/03/2005	49.45	44.87	3.48	3.75	06/23/2005	47.94	26.91	20.15	19.09	08/13/2005	22.25	11.59	9.83	10.75
05/04/2005	48.99	45.86	2.29	3.75	06/24/2005	43.49	17.82	24.90	22.00	08/14/2005	24.61	11.35	12.55	13.11
05/05/2005	62.42	59.14	2.37	3.75	06/25/2005	47.80	22.68	24.36	22.00	08/15/2005	23.13	11.38	10.92	11.63
05/06/2005	67.07	63.94	2.35	3.75	06/26/2005	40.49	16.53	23.21	21.88	08/16/2005	21.12	11.43	8.70	9.62
05/07/2005	82.03	78.33	2.91	3.75	06/27/2005	43.65	23.11	19.70	22.00	08/17/2005	21.12	11.56	8.70	9.62
05/08/2005	85.36	81.52	2.99	3.75	06/28/2005	46.89	26.38	19.70	21.86	08/18/2005	23.93	11.59	11.58	12.43
05/09/2005	80.29	76.89	2.43	3.75	06/29/2005	56.88	37.06	18.94	22.00	08/19/2005	19.81	10.80	8.23	8.31
05/10/2005	92.35	86.06	5.26	3.75	06/30/2005	53.10	31.52	20.66	22.00	08/20/2005	18.65	8.73	9.20	7.15
05/11/2005	101.04	96.28	3.85	3.75	07/01/2005	53.12	30.47	21.86	22.00	08/21/2005	20.99	11.58	8.50	9.49
05/12/2005	93.86	89.63	3.20	3.75	07/02/2005	40.78	18.11	21.86	22.00	08/22/2005	15.17	2.97	11.41	3.67
05/13/2005	87.48	81.70	4.99	3.75	07/03/2005	36.69	14.62	21.22	21.59	08/23/2005	23.44	11.53	10.99	11.94
05/14/2005	87.11	70.81	15.33	3.75	07/04/2005	44.93	22.14	21.86	22.00	08/24/2005	20.97	11.49	8.60	9.47
05/15/2005	87.35	83.35	3.09	3.75	07/05/2005	39.12	20.75	17.59	18.05	08/25/2005	20.93	11.50	8.60	9.43
05/16/2005	91.59	88.50	2.12	3.75	07/06/2005	42.64	18.95	22.78	22.83	08/26/2005	19.68	9.53	9.15	8.18
05/17/2005	122.82	95.21	26.63	3.75	07/07/2005	44.21	19.40	23.87	23.99	08/27/2005	21.11	11.62	8.70	9.61
05/18/2005	119.02	94.13	23.97	3.75	07/08/2005	40.77	16.60	23.37	23.89	08/28/2005	19.30	9.55	9.09	7.80
05/19/2005	118.36	93.01	24.58	3.75	07/09/2005	40.67	17.07	22.80	23.96	08/29/2005	20.75	11.50	8.40	9.25
05/20/2005	128.03	95.66	31.40	3.75	07/10/2005	28.41	11.63	15.96	16.91	08/30/2005	22.46	10.40	11.29	10.96
05/21/2005	133.89	95.88	37.16	3.75	07/11/2005	37.44	14.28	22.35	23.60	08/31/2005	17.75	6.70	10.14	6.25

TABLE F-7

BiOp Spill at Little Goose

Date	Outflow	Generation Flow	Actual Spill	BiOp Spill	Date	Outflow	Generation Flow	Actual Spill	BiOp Spill	Date	Outflow	Generation Flow	Actual Spill	BiOp Spill
04/01/2005	31.81	31.29	0.00	0.00	05/22/2005	96.33	23.11	0.00	0.00	07/12/2005	38.32	21.94	15.77	15.44
04/02/2005	39.20	38.69	0.00	0.00	05/23/2005	108.25	9.52	0.00	0.00	07/13/2005	37.04	21.05	15.30	15.27
04/03/2005	34.74	34.28	0.00	0.00	05/24/2005	109.27	2.00	0.00	0.00	07/14/2005	40.33	22.76	16.85	17.19
04/04/2005	33.08	32.57	0.00	0.00	05/25/2005	97.55	0.00	0.00	0.00	07/15/2005	33.43	19.10	13.72	14.01
04/05/2005	40.75	40.06	0.00	0.00	05/26/2005	96.37	0.00	0.00	0.00	07/16/2005	38.86	21.70	16.48	16.16
04/06/2005	40.01	39.38	0.00	0.00	05/27/2005	87.78	0.00	0.00	0.00	07/17/2005	34.89	18.93	15.43	15.13
04/07/2005	38.08	37.45	0.00	0.00	05/28/2005	85.32	0.00	0.00	0.00	07/18/2005	34.16	20.12	13.48	13.73
04/08/2005	34.64	34.01	0.00	0.00	05/29/2005	85.24	0.00	0.00	0.00	07/19/2005	34.72	19.70	14.39	14.43
04/09/2005	41.23	40.77	0.00	0.00	05/30/2005	81.02	0.00	0.00	0.00	07/20/2005	36.31	21.02	14.65	15.05
04/10/2005	42.05	41.42	0.00	0.00	05/31/2005	77.03	0.00	0.00	0.00	07/21/2005	37.39	21.40	15.48	15.78
04/11/2005	50.69	50.12	0.00	0.00	06/01/2005	84.39	1.04	0.00	0.00	07/22/2005	33.73	19.58	13.57	14.22
04/12/2005	47.95	47.32	0.00	0.00	06/02/2005	88.62	0.00	0.00	0.00	07/23/2005	35.57	21.00	13.92	14.30
04/13/2005	36.94	36.25	0.00	0.00	06/03/2005	84.10	0.00	0.00	0.00	07/24/2005	28.75	16.82	11.40	11.72
04/14/2005	38.09	37.40	0.00	0.00	06/04/2005	74.78	0.00	0.00	0.00	07/25/2005	28.28	16.70	10.93	11.24
04/15/2005	39.74	39.28	0.00	0.00	06/05/2005	73.31	0.00	0.00	0.00	07/26/2005	32.29	18.67	12.95	13.40
04/16/2005	35.25	34.62	0.00	0.00	06/06/2005	72.25	0.00	0.00	0.00	07/27/2005	28.86	16.35	11.81	12.11
04/17/2005	38.34	37.71	0.00	0.00	06/07/2005	69.82	0.00	0.00	0.00	07/28/2005	32.29	18.28	13.57	13.74
04/18/2005	43.65	43.08	0.00	0.00	06/08/2005	61.50	0.00	0.00	0.00	07/29/2005	35.15	19.68	14.96	15.53
04/19/2005	43.86	43.11	0.00	0.00	06/09/2005	60.11	0.00	0.00	0.00	07/30/2005	36.65	20.73	15.35	15.66
04/20/2005	44.20	43.33	0.00	0.00	06/10/2005	53.57	0.00	0.00	0.00	07/31/2005	31.35	17.74	13.10	13.31
04/21/2005	43.15	42.57	0.00	0.00	06/11/2005	49.83	0.00	0.00	0.00	08/01/2005	32.78	19.05	13.15	13.49
04/22/2005	39.35	38.69	0.00	0.00	06/12/2005	48.44	0.00	0.00	0.00	08/02/2005	34.21	19.31	14.36	14.74
04/23/2005	40.76	40.23	0.00	0.00	06/13/2005	50.70	0.00	0.00	0.00	08/03/2005	28.48	16.43	11.40	11.75
04/24/2005	41.28	40.70	0.00	0.00	06/14/2005	50.84	0.00	0.00	0.00	08/04/2005	29.14	18.00	10.63	10.89
04/25/2005	46.42	45.84	0.00	0.00	06/15/2005	46.72	0.00	0.00	0.00	08/05/2005	30.60	17.28	12.77	12.46
04/26/2005	49.69	49.06	0.00	0.00	06/16/2005	43.47	0.00	0.00	0.00	08/06/2005	36.23	20.27	15.50	15.14
04/27/2005	53.05	52.30	0.00	0.00	06/17/2005	44.75	0.00	0.00	0.00	08/07/2005	33.81	19.34	14.00	14.41
04/28/2005	54.93	54.35	0.00	0.00	06/18/2005	50.42	0.00	0.00	0.00	08/08/2005	28.94	15.99	12.38	12.44
04/29/2005	55.78	55.03	0.00	0.00	06/19/2005	53.11	0.03	0.00	0.00	08/09/2005	32.63	19.28	12.74	13.24
04/30/2005	53.44	52.87	0.00	0.00	06/20/2005	14.54	36.72	37.51	0.00	08/10/2005	27.12	15.88	10.68	10.95
05/01/2005	53.56	52.93	0.00	0.00	06/21/2005	15.43	33.49	34.36	0.00	08/11/2005	30.39	18.57	11.35	11.78
05/02/2005	47.79	47.15	0.00	0.00	06/22/2005	17.68	33.52	35.00	0.00	08/12/2005	23.81	13.21	9.92	8.98
05/03/2005	48.10	47.47	0.00	0.00	06/23/2005	12.57	38.03	38.68	0.00	08/13/2005	25.47	15.20	9.62	9.75
05/04/2005	47.77	46.85	0.00	0.00	06/24/2005	12.06	34.54	35.50	0.00	08/14/2005	25.41	15.35	9.60	9.66
05/05/2005	60.48	59.79	0.00	0.00	06/25/2005	14.55	35.50	37.70	0.00	08/15/2005	24.69	15.20	8.92	9.10
05/06/2005	65.48	64.96	0.00	0.00	06/26/2005	11.68	31.55	31.97	0.00	08/16/2005	21.91	14.13	7.22	7.85
05/07/2005	79.67	79.03	0.00	0.00	06/27/2005	14.72	28.70	30.04	0.00	08/17/2005	22.50	14.10	7.83	8.77
05/08/2005	82.50	81.81	0.00	0.00	06/28/2005	17.83	30.55	32.14	0.00	08/18/2005	26.00	15.11	10.15	10.34
05/09/2005	78.48	77.96	0.00	0.00	06/29/2005	27.53	30.53	31.25	0.00	08/19/2005	22.47	13.78	8.10	7.24
05/10/2005	89.64	88.89	0.00	0.00	06/30/2005	28.85	23.85	28.00	0.00	08/20/2005	20.18	11.32	8.23	6.21
05/11/2005	97.93	97.23	0.00	0.00	07/01/2005	34.93	17.84	25.03	0.00	08/21/2005	21.55	13.51	7.40	7.49
05/12/2005	88.48	87.85	0.00	0.00	07/02/2005	23.59	17.41	17.87	0.00	08/22/2005	19.64	9.83	9.28	8.15
05/13/2005	85.05	84.42	0.00	0.00	07/03/2005	21.68	17.42	16.65	0.00	08/23/2005	21.79	12.19	9.01	9.05
05/14/2005	84.85	84.21	0.00	0.00	07/04/2005	25.24	17.91	17.99	0.00	08/24/2005	20.75	12.89	7.05	7.52
05/15/2005	83.99	83.35	0.00	0.00	07/05/2005	22.98	17.51	16.94	0.00	08/25/2005	22.63	13.72	8.28	8.34
05/16/2005	89.17	88.59	0.00	0.00	07/06/2005	24.66	18.67	18.52	0.00	08/26/2005	21.06	12.88	7.53	7.90
05/17/2005	121.79	107.55	13.55	0.00	07/07/2005	26.72	19.21	19.35	0.00	08/27/2005	22.12	13.85	7.76	7.83
05/18/2005	115.82	108.41	6.71	0.00	07/08/2005	23.69	17.20	17.45	0.00	08/28/2005	21.27	13.13	7.60	7.65
05/19/2005	112.58	106.39	5.50	0.00	07/09/2005	22.56	17.27	17.72	0.00	08/29/2005	21.51	13.02	8.00	8.13
05/20/2005	129.10	109.89	18.56	0.00	07/10/2005	17.42	12.98	13.20	0.00	08/30/2005	20.70	12.86	7.16	7.47
05/21/2005	134.12	109.56	24.06	0.00	07/11/2005	21.89	16.08	16.23	0.00	08/31/2005	20.35	12.79	6.87	7.28

TABLE F-8

BiOp Spill at Lower Granite

Date	Outflow	Generation Flow	Actual Spill	BiOp Spill	Date	Outflow	Generation Flow	Actual Spill	BiOp Spill	Date	Outflow	Generation Flow	Actual Spill	BiOp Spill
04/01/2005	38.90	38.46	0.00	0.00	05/22/2005	125.60	85.17	39.93	0.00	07/12/2005	40.34	11.41	28.40	28.84
04/02/2005	38.25	37.95	0.00	0.00	05/23/2005	122.78	85.06	37.15	0.00	07/13/2005	38.15	18.87	18.92	19.13
04/03/2005	36.08	35.78	0.00	0.00	05/24/2005	116.23	85.38	30.33	0.00	07/14/2005	40.85	13.41	27.14	29.18
04/04/2005	33.93	33.48	0.00	0.00	05/25/2005	100.97	84.57	15.82	0.00	07/15/2005	33.70	15.15	17.88	17.81
04/05/2005	41.13	40.62	0.00	0.00	05/26/2005	98.85	84.51	13.97	0.00	07/16/2005	37.59	18.30	18.92	18.50
04/06/2005	42.90	42.46	0.00	0.00	05/27/2005	89.24	83.99	4.66	0.00	07/17/2005	36.28	11.65	24.12	24.45
04/07/2005	37.69	37.31	0.00	0.00	05/28/2005	87.40	84.28	2.68	0.00	07/18/2005	33.04	14.80	17.73	18.17
04/08/2005	36.33	35.88	0.00	0.00	05/29/2005	84.31	83.80	0.00	0.00	07/19/2005	38.07	11.67	25.89	26.59
04/09/2005	42.83	42.46	0.00	0.00	05/30/2005	81.45	81.00	0.00	0.00	07/20/2005	37.00	16.52	19.91	20.37
04/10/2005	40.40	39.82	0.00	0.00	05/31/2005	78.98	73.43	4.97	0.00	07/21/2005	38.45	12.65	25.51	25.84
04/11/2005	46.99	46.48	0.00	0.00	06/01/2005	88.72	77.00	11.19	0.00	07/22/2005	33.57	11.58	21.33	22.07
04/12/2005	37.10	36.73	0.00	0.00	06/02/2005	89.95	81.56	8.01	0.00	07/23/2005	35.11	11.59	22.88	23.61
04/13/2005	38.04	37.39	0.00	0.00	06/03/2005	83.81	81.88	1.57	0.00	07/24/2005	29.65	11.70	17.52	18.15
04/14/2005	39.06	38.62	0.00	0.00	06/04/2005	76.54	76.24	0.00	0.00	07/25/2005	28.25	11.72	15.95	16.75
04/15/2005	39.50	39.06	0.00	0.00	06/05/2005	74.31	74.01	0.00	0.00	07/26/2005	32.82	11.43	20.74	21.32
04/16/2005	35.73	35.36	0.00	0.00	06/06/2005	74.00	62.66	10.98	0.00	07/27/2005	26.76	11.39	15.01	15.26
04/17/2005	37.70	37.33	0.00	0.00	06/07/2005	74.15	56.77	16.81	0.00	07/28/2005	31.35	11.35	19.71	19.85
04/18/2005	44.98	44.46	0.00	0.00	06/08/2005	62.66	62.29	0.00	0.00	07/29/2005	33.04	11.36	21.10	21.54
04/19/2005	43.26	42.60	0.00	0.00	06/09/2005	59.90	56.61	2.92	0.00	07/30/2005	35.62	11.43	23.77	24.12
04/20/2005	43.50	42.99	0.00	0.00	06/10/2005	54.14	53.70	0.00	0.00	07/31/2005	28.93	11.50	16.90	17.43
04/21/2005	41.27	40.83	0.00	0.00	06/11/2005	51.59	51.29	0.00	0.00	08/01/2005	32.09	11.39	20.11	20.59
04/22/2005	39.61	38.96	0.00	0.00	06/12/2005	50.28	49.98	0.00	0.00	08/02/2005	30.57	11.03	19.10	19.07
04/23/2005	39.77	39.33	0.00	0.00	06/13/2005	50.65	50.28	0.00	0.00	08/03/2005	28.20	11.40	16.35	16.70
04/24/2005	41.93	41.49	0.00	0.00	06/14/2005	50.45	49.93	0.00	0.00	08/04/2005	26.52	11.55	14.44	15.02
04/25/2005	45.92	45.48	0.00	0.00	06/15/2005	48.30	47.93	0.00	0.00	08/05/2005	29.79	11.76	17.45	18.29
04/26/2005	47.93	47.42	0.00	0.00	06/16/2005	44.80	44.50	0.00	0.00	08/06/2005	33.69	11.81	21.42	22.19
04/27/2005	52.73	52.22	0.00	0.00	06/17/2005	46.35	45.98	0.00	0.00	08/07/2005	32.16	11.81	19.93	20.66
04/28/2005	55.10	54.80	0.00	0.00	06/18/2005	50.74	50.44	0.00	0.00	08/08/2005	27.65	10.70	16.51	16.15
04/29/2005	54.93	54.49	0.00	0.00	06/19/2005	52.65	52.14	0.07	0.00	08/09/2005	29.22	11.48	17.29	17.72
04/30/2005	54.11	51.06	2.69	0.00	06/20/2005	55.59	15.88	39.21	39.92	08/10/2005	27.63	11.45	15.58	16.13
05/01/2005	51.58	51.20	0.00	0.00	06/21/2005	51.50	27.68	23.37	23.79	08/11/2005	26.05	11.41	14.12	14.55
05/02/2005	47.69	43.40	3.83	0.00	06/22/2005	51.04	32.34	18.11	18.50	08/12/2005	23.60	11.48	11.55	12.10
05/03/2005	46.08	45.49	0.00	0.00	06/23/2005	51.48	17.17	33.93	34.63	08/13/2005	23.51	11.50	11.50	12.01
05/04/2005	49.41	48.90	0.00	0.00	06/24/2005	50.01	12.07	37.63	38.38	08/14/2005	23.43	11.50	11.54	11.93
05/05/2005	60.43	59.98	0.00	0.00	06/25/2005	48.96	25.25	23.21	23.53	08/15/2005	23.20	11.51	11.16	11.70
05/06/2005	67.02	66.65	0.00	0.00	06/26/2005	43.67	15.40	28.01	28.71	08/16/2005	20.84	10.30	9.97	9.34
05/07/2005	79.37	75.97	3.11	0.00	06/27/2005	42.54	21.06	20.95	21.05	08/17/2005	22.26	8.48	13.41	10.76
05/08/2005	82.36	81.85	0.00	0.00	06/28/2005	48.38	29.23	18.71	18.50	08/18/2005	23.01	11.40	11.03	11.51
05/09/2005	77.62	71.03	6.23	0.00	06/29/2005	59.95	25.70	33.87	34.50	08/19/2005	18.64	10.09	7.90	7.62
05/10/2005	91.33	84.69	6.19	0.00	06/30/2005	55.55	15.06	40.06	40.48	08/20/2005	20.00	10.20	9.29	8.50
05/11/2005	98.90	84.92	13.47	0.00	07/01/2005	51.51	26.94	24.23	24.25	08/21/2005	19.66	11.45	7.72	8.16
05/12/2005	88.75	84.42	4.03	0.00	07/02/2005	44.97	14.80	29.74	29.93	08/22/2005	18.65	8.71	9.61	7.15
05/13/2005	85.12	83.19	1.48	0.00	07/03/2005	40.98	19.28	21.20	21.37	08/23/2005	19.87	11.34	8.02	8.37
05/14/2005	84.58	84.00	0.00	0.00	07/04/2005	40.57	21.89	18.32	18.50	08/24/2005	18.67	11.35	6.80	7.17
05/15/2005	83.87	83.57	0.00	0.00	07/05/2005	42.43	11.73	30.05	30.46	08/25/2005	19.89	11.17	8.14	8.39
05/16/2005	91.72	83.50	7.63	0.00	07/06/2005	44.16	22.30	21.41	21.45	08/26/2005	20.48	11.50	8.40	8.98
05/17/2005	124.14	85.79	37.90	0.00	07/07/2005	49.22	15.77	33.09	33.68	08/27/2005	20.48	11.50	8.40	8.98
05/18/2005	121.81	85.60	35.74	0.00	07/08/2005	44.03	11.46	32.18	32.53	08/28/2005	20.70	11.50	8.40	9.20
05/19/2005	118.72	84.65	33.63	0.00	07/09/2005	41.30	19.55	21.23	21.47	08/29/2005	21.51	6.52	14.62	10.01
05/20/2005	135.30	86.16	48.61	0.00	07/10/2005	32.71	13.83	18.30	18.50	08/30/2005	20.70	6.24	13.80	9.20
05/21/2005	137.95	85.91	51.62	0.00	07/11/2005	37.80	12.74	24.61	25.02	08/31/2005	19.92	7.93	11.54	8.42